ENERGee Watch

European NEtwork
of
Regional GHG Emissions
and Energy Watch

Comparing data between EU Regions

December 2013

Forward

There is a broad consensus amongst the Intergovernmental Panel on Climate Change (IPCC) that climate change is due to the intensification of the greenhouse effect from human activity. Indeed, since the start of the industrial era at the end of the 18th century, greenhouse gas concentrations have never been so high for several hundreds of thousands of years and continue to rise along with population growth.

Climate change mitigation and adaptation policies need to be designed and implemented at the international, regional and local levels, with close coordination between them. In particular, one level of governance which has a central role to play is Regional Government, through its:

- proximity to citizens
- more thorough knowledge of the territory it covers
- greater flexibility than national governments
- responsibility for many policy areas relating to climate policy: energy, transport, housing, industry, environment,...

The European Commission is recognizing the need to give more importance to the work done by Regions. However, in order to define climate strategies that are relevant to the evolving regional context, Regions need energy and GHG emissions data to base their priorities on. Monitoring such data is a prerequisite that is still often lacking today, which initiatives such as ENERGee-Watch (created in 2012) aim to address, by reinforcing and pushing for the creation of more regional Observatories of energy and GHG emissions.

We can only welcome such an initiative, and hope it will instigate wider discussions and action at the regional level regarding the need for monitoring through Observatories.

Julije DOMAC
President of FEDARENE

By initiative of Roger LERON
former President of FEDARENE

Regional Energy & GHG Observatories

In March 2007 the European Council set a series of energy and climate targets for the EU to meet by 2020, known as the «20-20-20» or « 3x20» targets:

- Improve energy efficiency by 20% *(which consists, in concrete terms, of ensuring that primary energy consumption is 20% lower than the consumption corresponding to a «business-as-usual scenario». Since this scenario is not easily calculable and often not calculated, the year 2005 is often used as the reference year. In this document, data for 2005 was often unavailable so we took 2000 as the reference year).*
- Ensure 20% of EU energy consumption comes from renewable energy sources
- Reduce EU GHG emissions by 20% compared to 1990 levels

In March 2009, binding legislation was adopted through a Climate and Energy Package, to implement the above 20-20-20 targets. This legislative package establishes specific policies to reach these goals and distributes them to the Members States (which may adopt more restrictive GHG emissions regulations if they wish).

To reach these targets, regions and local authorities have a leading role, due to their proximity and thorough knowledge of the territory at the 'ground level'. The EU is encouraging this role and development of regional and local strategies for concrete actions on the ground (SEAPs - Sustainable Energy Action Plans), all of which contribute towards the overall national strategy.

To be relevant and answering the right priorities, these regional and local strategies need to be informed by data. Since national energy and GHG data are not accurate or comprehensive enough, many regional and local authorities are already gathering such data, through what are called "Regional Energy & GHG Observatories".

These Observatories are managed by a local consortium (for example: regional energy agency, regional authority, air quality agency, consumers representative, industry representative, manager of the public electricity distribution network…) which is financially supported by public authorities.

Origin of the project

The monitoring of energy and GHG emissions is an absolute prerequisite for taking appropriate action towards meeting EU 20-20-20 targets, as it enables us to:

- Characterize the current situation; identify trends and influencing factors;
- Determine both quantitative and qualitative priorities;
- Identify resources and levers for taking action;
- Track progress in terms of fixed objectives; adjust efforts.

Since the monitoring of GHG emissions is a powerful tool to build a representation of the regional impact on climate change and inform strategies for its reduction, the choice of the monitoring methodology is not neutral. The methodology must provide an overall picture of GHG emissions and must not be geographically limited to administrative boundaries (an approach suggested by the concept of “territorial emissions”).

To this effect, the INTERREG IVC project CLIMACT Regions (www.climactregions.eu) gathered in **2012**, through a European-wide survey, more than 140 good practices in the field of GHG monitoring methodologies, climate protection policies, and governance.

Out of these, more than 20 regional GHG and energy observatories were identified. Some of these observatories then decided to form the ENERGee-Watch consortium together, to better share experiences and compare methodologies.

Missions

The methodologies used to monitor GHG emissions in the EU are based on International standards (IPCC and Corinair) and national methodologies. In this regard, the Observatories identified through the Energee-Watch network expressed the need for more standardisation amongst observatories, in order to enable comparisons between European territories.

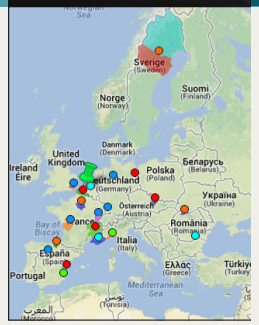
The ENERGEE-Watch network aims to foster this harmonisation, and encourage the creation of more observatories, through three main missions:

1. To share experiences between regional/local public authorities in the field of energy and GHG inventory;

2. To share experiences amongst GHG monitoring organisations. For example by:
- Sharing how to set up a local observatory and involve local stakeholders;
- Comparing existing monitoring methodologies and processes;
- Comparing existing partnership agreements for data collection and diffusion;
- Comparing and evaluating existing tools (GIS, etc);
- Complying with European directives (Inspire: exchange of environmental data etc).

3. Involve and work with European organisations to:
- Define methodologies suited to local needs (bottom up approaches,...);
- Define common guidelines in order to be able to compare the performance of territories;
- Improve national and international observation methodologies based on feedback from regional approaches (bottom-up);
- Evaluate the European energy policies (COM).

Members



Initiated by 10 Regions or Regional Energy Agencies and FEDARENE:

AMEMM - Agenţia de Management Energetic Maramureş, Romania

ARE Liguria - Agenzia Regionale per l'Energia della Liguria, Italy

CEAM - Centro de Estudios Ambientales del Mediterráneo, Spain

Regional Council Nord-Pas-de-Calais France

EAZK - Energetická agentura Zlínského kraje, Czech Republic

Kent County Council United Kingdom

NENET - Norrbottens energikontor Sweden

RAEE - Rhônalpénergie-Environnement France

Rhône-Alpes Region, France

FEDARENE - European Federation of Agencies and Regions for Energy and the Environment, Brussels

ENERGee-Watch also counts:

AEEPM - Local Energy Agency Bucharest, Romania

ARENE Ile de France France

Atmo Franche Comté - OPTEER France

Climate Alliance, GmbH, Germany

CO2online - GmbH, Germany

EVE - Ente Vasco de la Energia Basque Country, Spain

Energy Observatory of Region Provence-Alpes-Côte d'Azur - ORE France

EREN - Ente Regional de la Energía de Castilla y León, Spain

ICLEI - Local Governments for Sustainability

This first ENERGee-Watch report (2013) shows energy and GHG emissions facts and figures in the following 8 European partner regions of ENERGee-Watch: *Basque country (ES), Franche-Comté (FR), Ile-de-France (FR), Liguria (IT), Norrbotten (SV), Provence-Alpes-Côte-d'Azur (FR), Rhône-Alpes (FR), Zlín (CZ).*

Methodology

Reference year:

The year 2008 was chosen because it was the latest year with available data for every region. In some regions, more up-to-date data is available, from the regional energy agency, the regional statistical office or the regional energy & GHG observatory. Overall, **this reveals a clear lack of and need for more recent data across Europe.**

Climatic correction

Consumption data are real data, meaning that there is no climatic correction taken into account, even if the year was particularly warm or cold.

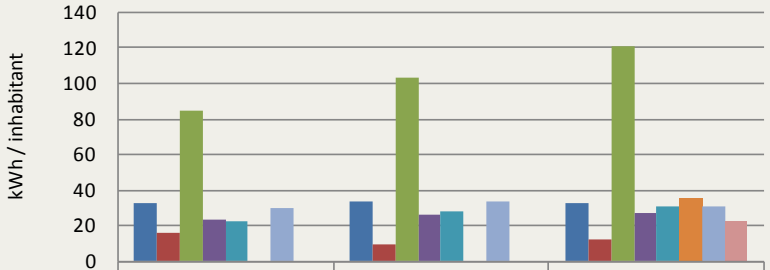
Sources of data:

The data used comes from each partner; every partner is responsible of the origin of its data.

For the reasons above, the data can somewhat differ from other official sources.

N.B. The European objective of improving energy efficiency by 20% by 2020 consists, in concrete terms, of ensuring that primary energy consumption is 20% lower than the consumption corresponding to a «business-as-usual scenario». Since this scenario is not easily calculable and often not calculated, the year 2005 is often used as the reference year. In this document, data for 2005 was often unavailable so we took 2000 as the reference year.

Final energy consumption (kWh / inhabitant)



	1990	2000	2008
Rhône-Alpes	32691	33160	32428
Zlín	16095	9823	11789
Norrbotten	84938	103474	120686
Ile-de-France	22981	26171	26677
Basque Country	22392	27972	30951
Franche-Comté	-	-	35407
Provence-Alpes-Côte-d'Azur	29774	34063	30443
Liguria	-	-	22327

Population, climatic context, and GDP are three key elements which can explain that final energy consumption per inhabitant differs between regions.

Basque region: the increase in final energy consumption from 1990 to 2008 is primarily due to the increase in GDP. Since 2008, the financial and economic crisis has brought down energy consumption in the industry and transport sectors.

Franche-Comté: final energy consumption in this region mostly comes from road transportation, with it being a rural region. Notably, the region has a high share of electricity consumption in its final energy mix (22 %) which is typical of the French energy mix.

Ile-de-France: final energy consumption increased until 2005 as a result of a growing population and building stock, and consumption increases in the transport sector. Final energy consumption has stabilised in the region since then.

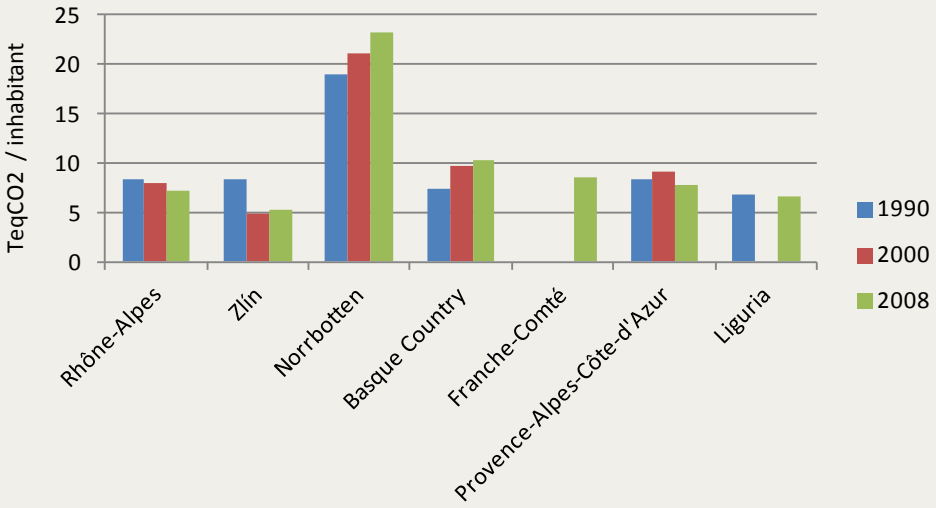
Norrbotten's energy consumption stands out, owing to the rigorous climatic conditions and long travel distances in this sparsely populated region. The region's high energy consumption and increases in consumption between 1990 and 2008 also highly relate (60-70%) to heavy industries (steel, mining, forestry - including the paper industry) and their increase in production, while the energy demand per ton product decreased a little.

Provence-Alpes-Côte-d'Azur: the evolution of the region's final energy consumption is highly connected to the industry sector. From 1990 to 2000, industry production and related transportation activities increased, generating increases in energy consumption. From 2000 to 2008, the opposite trend occurred but was compensated by an increased consumption by the residential sector of +1.5% each year.

Rhône-Alpes' final energy consumption continuously increased between 2000 and 2005 to reach a peak in 2005. Buildings were the main final energy consumers, with the tertiary and residential sectors consuming 41% of final energy, all uses taken into account. Transport consumed the same amount as industry. Petroleum products were by far the most consumed form of energy, fossil energy representing 68% of the total mix.

Greenhouse gases (GHG) emissions (tCO2 eq / inhabitant)

* 0 = no data



Basque region: GHG emissions increased from 1990 to 2008, as energy use increased. The financial crisis begun in 2008 has since then led to a decrease in activity and thus in GHG emissions.

Franche-Comté's GHG emissions are due to the industry, agriculture and housing sectors (in an equal share of approximatively 20 % each) as well as the transport sector (35 %) owing to the rural nature of the region and thus transport needs between the upper-Rhine and Rhône valleys.

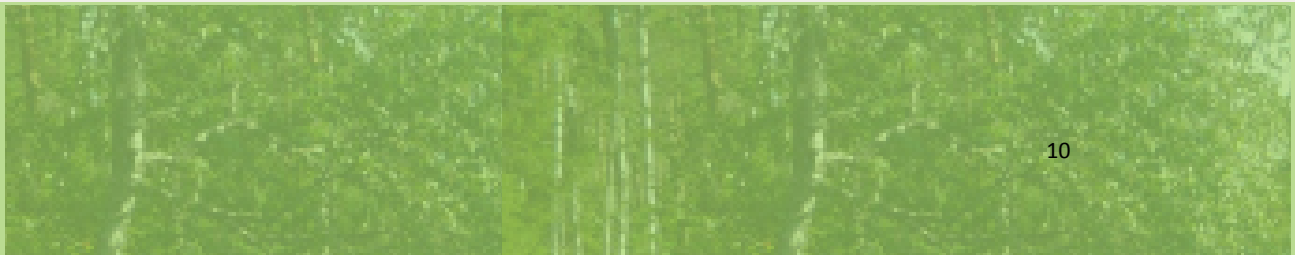
Liguria: between 1990 and 2008 some manufacturing industries closed or turned to new technologies which resulted in a small decrease in GHG emissions.

Norrbotten: GHG emissions values are double that of the other regions in large part due to its mineral industry.

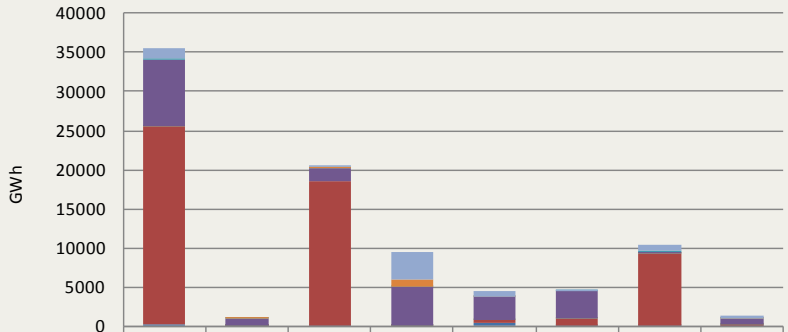
Provence-Alpes-Côte-d'Azur: 4 refineries and 3 power plants working with gas and coal account for around 5 million Teq CO2 emissions annually.

Rhône-Alpes has seen an even downward trend in its GHG emissions between 1990 and 2008, whilst they remained slightly higher to the French average. Nonetheless, a Rhône-Alpes inhabitant emitted on average 3 times less GHG than a North American and 6 times more than an African. Because of the large amount of nuclear power stations in France, GHG emissions in France and in the Rhône-Alpes region are much lower than the European average.

Zlín: big changes in industry at the national and regional levels took place between 1990-2000. Large, ineffective, industrial companies were closed or dramatically downsized and new technologies were installed in surviving businesses. Furthermore, a large development of the natural gas network was supported by the national government (space heating for households). The 2000-2008 period was influenced by economic development resulting in higher energy consumption; however, new technologies and building refurbishments reduced the increases in GHG emissions.



Renewable energy production (GWh, year 2008)



	Rhône-Alpes	Zlín	Norrbotten	Ile-de-France	Basque Country	Franche-Comté	Provence-Alpes-Côte-d'Azur	Liguria
Waste (electricity and heat)	1426	0	229	3393	625	276	755	322
Geothermal (incl. Heat Pumps)	-	6	82	1040	1.5	-	0	21
Solar Thermal	92	1	1	13	13	18	58	6
Biomass and biogas (heat and electricity)	8506	1065	1794	4944	3007	3541	283	783
Photovoltaic	10	2	-	1	18	1	2	4
Hydraulic	25271	16	18482	59	426	855	9200	222
Wind power	294	0.6	1.4	0.08	356	53	86	17

Renewable energy production can vary a lot from one region to another, depending on the availability of natural resources (rivers for hydraulic power production, number of days of sunshine for solar power,...), as well as the state of the economy.

Franche-Comté forests cover 43 % of the region's surface area, explaining the high share of biomass (75 %) in the total renewable energy production mix, complemented by local productions of hydroelectricity (20 %) with both conventional dams and run-of-the-river hydroelectric power stations.

Ile-de-France has the most important potential for geothermal energy in France. Furthermore, it has a high number of district heating networks (more than 100) which are a great vector for the use of renewable energy sources (in Ile-de-France mainly energy recovery for waste, biomass and geothermal energy).

Liguria: the main renewable energy source in the region is forest biomass; its use started to see a significant upward trend since the second half of the 2000s.

Norrbotten: about 14 % of the total Swedish electricity use comes from hydraulic power, whilst about 2/3rd of its 18 TWh (year 2008) is exported.

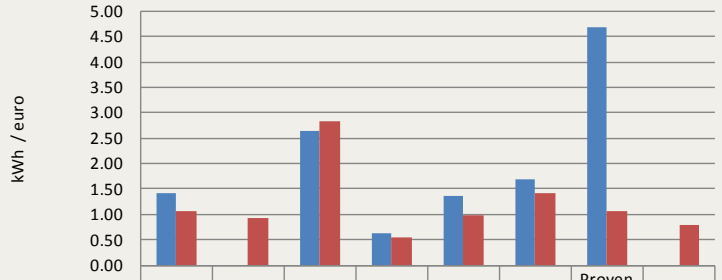
Provence-Alpes-Côte-d'Azur is the first French region in terms of solar energy (electricity and thermal) due to its sunny location near the Mediterranean Sea. In 2012, solar energy represented 4% of total energy production in the region, whilst it was only 0.5% only three years back in 2009.

Rhône-Alpes: renewable energy represents about 20% of total energy production in this region. Regarding electricity, the region produces a lot of it, owing to its nuclear power stations (73.8% of energy production) and hydraulic power (15.3%). It is thus a net exporter of electricity.

Zlín: Solar thermal energy production data is inexact mostly because only the surface area of solar collectors is recorded (mostly of private citizens' installations). Regarding biomass and biogas, a boom in new installations started around 2008 when 3 new farm biogas plants were built.

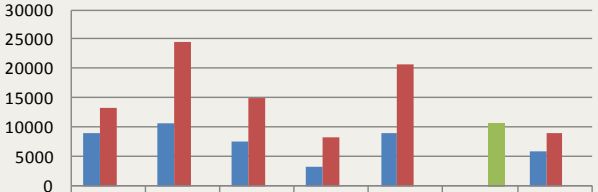
Energy Intensity (year 2008)

Industry and the regional economy (kWh / €)



	Rhône-Alpes	Zlín	Norrbotten	Ile-de-France	Basque Country	Franche-Comté	Provence-Alpes-Côte-d'Azur	Liguria
Energy intensity of industry	1.43	-	2.65	0.63	1.36	1.69	4.69	-
Energy intensity of economy	1.06	0.94	2.82	0.56	0.98	1.42	1.06	0.79

Residential and tertiary sectors (kWh / inhabitant; kWh / employee)



	Rhône-Alpes	Norrbotten	Ile-de-France	Basque Country	Franche-Comté	Provence-Alpes-Côte-d'Azur	Liguria
Energy intensity of residential sector (kWh/inhabitant)	9055	10785	7507	3357	8960		5890
Energy intensity of services (kwh per employee)	13253	24579	15054	8230	20698		9000
Energy intensity of residential & tertiary (services) sectors (kWh/inhabitant; kWH/employee)						10655	

Energy intensity refers to the amount of energy consumed to produce a given level of output / activity. It is expressed as energy per unit of output or activity.

Basque region: the low energy intensity of the residential and tertiary sectors is due to mild climatic conditions and the compact design of cities.

Franche-Comté's economic energy intensity is situated in the average due to a mix of energy intensive activities (chemistry, cement,…) and less energy intensive industries (micromechanics, car manufacturing, luxury goods,…).

Ile-de-France: the industry sector accounts for less than 10% of the region's energy consumption as the tertiary sector is the leading source of income. Population density as well as GDP per capita are high in this premier region of France.

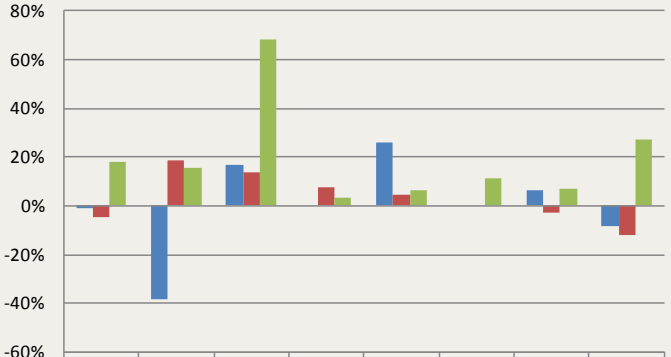
Liguria:
• energy intensity of industry: in the last few years a transformation has occurred from the heavy industry to the tertiary sector that has a lower energy consumption;
• energy intensity of the residential sector is low due to favourable climatic conditions.

Norrbotten:
• the high energy intensity of industry relates to the heavy industries in the region;
• the high energy intensity of the residential sector relates to the cold climatic conditions.
Both moreover relate to the historically low electricity/energy costs.

Provence-Alpes-Côte-d'Azur: the high energy intensity of industry is due to the presence of a lot of heavy industries (steal, paper, refineries,…), which use a lot of energy, in the region. 33% of the energy consumption in the region comes from the industries whist the French average is around 20%. To illustrate this, the most important industrial facility hosted in Provence-Alpes-Côte-d'Azur (Arcelor Mittal - steel and mining company) represents on its own 1% of the national and 15% of the region's energy consumption.

EU 20-20-20 indicators (year 2008)

- Reduce GHG emission levels by 20% compared to 1990 levels (if data available)
- Improve energy efficiency by 20% - also known as “reduce final energy consumption by 20% compared to 2005 levels (or 2000 levels if not available)” - *see N.B page 6*.
- Raise the share of renewable energy sources to 20% of final energy consumption, notably by developing biofuels and other renewable sources for transport



	Rhône-Alpes	Zlín	Norrbotten	Ile-de-France	Basque Country	Franche-Comté	Provence-Alpes-Côte-d'Azur	Liguria
Changes in GHG emissions compared to 1990	-1.2%	-38.2%	16.8%	-	26.1%	-	6.6%	-8.4%
Level of increase in final energy consumption compared to 2000 (Rhône-Alpes, Basque Country and Liguria compared to 2005)	-5.0%	18.6%	13.6%	7.8%	4.4%	-	-3.0%	-12.3%
Share of RES production in final energy consumption	18.0%	15.7%	68.3%	3.0%	6.6%	11.5%	7.0%	27.1%

What’s next

ENERGee-Watch members will continue to:

- monitor energy production and consumption, and GHG emissions within their territory
- compare data sources and retrieval methodologies
- take part in the newly selected IEE project “DATA4ACTION”: *Facilitating public authorities access to energy data for better implementation and monitoring of SEAP actions through effective and structured collaboration with energy data providers.*

So **check out the ENERGee-Watch website** for more information on:

- energy and GHG related news
- energy, GHG, and observatories related publications
- a map of network members and their presentation
- discussions on relevant software programmes (Members Area restricted access)

and **join our network and benefit from its pool of experiences!**

Join our nework!

on www.energee-watch.eu

Join ENERGee-Watch !

To become a member, *free of charge*, and exchange with other Observatories, please visit the ENERGee-Watch website and fill in the membership application form.

The membership is free and implies the following:

- Sharing the principles of the network,
- Participation in the annual meeting and webinars,
- Active contribution to the activities of the network.

Visit our website

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